

## NEW YORK CHAPTER WILL GIVE SMOKER

Annual Affair Will Feature  
Revue and Stage Stars

By Marshall T. Garlinger

On May 3, at the Plaza Hotel, Jersey City, N. J., the New York chapter will put on its Ninth Annual Smoker. Those fortunate enough to attend previous smokers can testify to the banquets, the prizes, the souvenirs, the cigars and the climax of the evening—the knock-out shows to which everyone wanted a front seat. Tim Holden, secretary of the New York chapter, can testify to this.

The committee in charge of arrangements is working hard to keep the Ninth Annual Smoker on a par with those of previous years despite present business conditions.

The cost of the banquet will be brought down to compare with present price levels, and the committee is making every effort to hold the price to \$2.50 per plate.

Previous smokers have been attended by between three and four hundred steel treaters and their guests.

The entertainment at the coming smoker, directed by a special master of ceremonies, will feature professional stage talent, as well as several acts by talented members and friends.

Those who have seen the girl revue which will be staged, say that it is a knock-out and a comedy team from Lew Dockstader's Minstrels will bring back old memories to many. Several surprise acts will round out the program. Music will be furnished by a tuneful orchestra.

In the past, many companies have favored us with prizes and souvenirs. Accordingly, any company or laboratory wishing to contribute prizes or souvenirs can communicate with M. T. Garlinger (Personal) Room 2137 195 Broadway, New York City.

Steel treaters and their guests who wish to make early reservations can do so by communicating with Al Gobus, 1857 Stuart Street, Brooklyn, New York.

The New York chapter extends a cordial invitation to A.S.S.T. members of other chapters and their friends to attend the smoker, particularly those of the New Jersey chapter.

The Committee wishes to stress the point that the Plaza Hotel, Jersey City is within convenient reach of all in the New York metropolitan area.

## INDIANAPOLIS HAS NELSON AS SPEAKER

Heat and Corrosion Resisting  
Steels are March Subject

By A. E. Focke

Dr. T. Holland Nelson, consulting engineer for the Midvale Co., Philadelphia, was the guest speaker at the regular monthly meeting of the Indianapolis chapter.

This meeting was held March 7 in the Severin Inn. About 100 members and guests interested in Dr. Nelson's subject, "Heat Resisting and Corrosion Resisting Steels," were able to learn of the latest developments in this interesting field.

Dr. Nelson's intimate association with the pioneering work of Brearley and his specialization in this field, allowed him to present his data in an authoritative manner which convinced his audience.

Dr. Nelson developed his talk from the early history of the Brearley investigations on a superior lining for a 12" naval gun down through the cutlery developments and ended with the latest developments in corrosion resisting castings and sheets for the chemical industry.

In discussing heat resisting alloys, Dr. Nelson showed that the fundamental principle of corrosion resistance applied since this was merely a specialized case of the general problem.

The principle note of Dr. Nelson's talk emphasized the need of investigating each problem separately and the futility of using one test such as the copper sulphate test to measure the relative value of corrosion resistant materials to be used under different conditions of solutions or temperatures.

Lively discussion followed the talk.

## PITTSBURGH HAS DISCUSSION OF HEAT TREATING PROBLEMS

Meeting Features Talk by Cox

By George P. Halliwell

After the usual monthly dinner at the Keystone Athletic Club, the regular meeting of the Pittsburgh chapter was preceded by a moving picture film showing the large-scale automatic heat-treating processes connected with the 1400-odd parts requiring it in the modern automobile.

Mr. Cox of the Pittsburgh Commercial Heat Treating Co., then gave a talk on the various phases and problems of heat-treating confronting any concern doing an irregular and varied line of work. One difficulty encountered was lack of information from the customer concerning composition of steel, making it necessary to obtain chemical analyses or to make trial heat treatments, before the correct heat treatment could be determined.

During the discussion following Mr. Cox's talk, some very pertinent points were brought out on the future composition of most of our steels, particularly with reference to molybdenum and copper, as a result of the use of scrap containing these elements. Following this the discussion gravitated into an exchange of views held by various members as to the mechanism of case hardening.

## 3 OHIO CHAPTERS TO MEET APRIL 14

Dayton, Cincinnati, Columbus  
Men Will Gather In Dayton

An interesting program has been arranged for the annual joint meeting of the Cincinnati, Dayton and Columbus chapters which will be held in Dayton on April 14.

The first event of the day will be a luncheon at the Dayton Engineers' Club for the executive officers of the three participating chapters.

Leaving the Engineers' Club at 1:30 P. M. members and guests of the chapters will visit interesting plants in the vicinity. Foundries, forge shops, heat treating plants and manufacturing establishments have agreed to escort visitors around.

Dinner will be served in the evening at the Engineers' Club. The guest speaker will be F. N. Speller, director of the department of metallurgy and research, National Tube Co. "Causes and Prevention of Corrosion" will be his subject.

All members of the Society and their friends are urged to attend the plant inspections and the dinner. The Engineers' Club, headquarters for the meeting, is at Monument and Jefferson Aves., Dayton.

### L. W. SPRING DIED ON MARCH 23

Laverne W. Spring, chief metallurgist for Crane Co., Chicago, died March 23. Mr. Spring was an active member of the Chicago chapter of the Society and also served on the Subcommittee on Heat Treatment of Steel Castings of the Recommended Practice Committee. He was with Crane Co. since 1904.

## METAL PROGRESS ABSTRACT SERVICE KEPT UP-TO-DATE

"Concentrates," the abstracts of current technical lectures which form a monthly department of *Metal Progress*, were instituted to fill the popular demand for a truly up-to-date and informative abstract service.

"We had observed that abstract and index services generally had to run anywhere from three to six months behind in their lists of published technical articles because of their very nature," E. E. Thum, editor of *Metal Progress*, said.

"Moreover, their lists contained hardly more than titles of papers, their authors and source of publication and were hardly abstracts in the true sense of the word because they gave little indication of the actual contents of the articles.

"Our 'Concentrates' present brief summaries, seldom longer than 200 words, of valuable writings which have appeared during the current month in

## Meet Two Officers From Muncie Group

W. E. Sanders



E. M. Kingsley

W. E. Sanders, of Muncie Products Division, General Motors Corp., chairman of the Muncie group, and E. M. Kingsley of the same organization, the group's secretary are shown above.

The March 30 meeting of the "baby" Muncie group attracted 140 for dinner, and 170 heard talks by Secretary Eisenman and President d'Arcambal of the National organization.

The use of an extra large bulletin announcing this meeting, followed by personal letters and final reminders, with about a dozen press notices, resulted in a packed house.

Secretary Eisenman presented charter to the group and described services rendered by the A.S.S.T. President d'Arcambal's talk on "Tool Steels" held the attention of the crowd and resulted in much discussion.

## HEAT TREATED CAST IRON BOSTON TOPIC

Oliver Smalley Pleases Crowd  
With Talk on March 4

By Howard E. Handy

"Heat Treatment of Cast Iron" was the subject discussed by Oliver Smalley, director of research for the Cast Iron Institute, Pittsburgh, before a well attended meeting of the Boston chapter at Massachusetts Institute of Technology on March 4. Mr. Smalley outlined in detail the suitability for heat treatment of different types and compositions of gray cast irons, with special reference to the formation and occurrence of the graphitic carbon.

He discussed the varying percentages of the different elements common to cast iron and their effect on the critical changes during heating and cooling; and then described the various methods for the annealing, hardening and tempering of parts made from cast iron possessing the chemical and physical characteristics necessary to render them suitable for heat treatment.

One of the interesting points brought out by Mr. Smalley was that all cast iron, on heating, has a so-called "brittle range" between 540° F. and about 850° F. necessitating extreme care being taken when castings are heated from normal temperature to about 1100° F. The talk was very well illustrated with slides and considerable discussion followed the presentation.

A dinner held in Walker Memorial prior to the meeting, was attended by 60 members.

British and American journals. Almost 50 magazines are read carefully every month for material for this department.

"The articles finally selected are all concerned with topics which are of known interest to *Metal Progress* readers but which they might have failed to see. Our plan of printing abstracts not more than one month after the original article appears means that the information is still fresh.

"The length assigned to each item in 'Concentrates' means that a full abstract can be presented, with all essential information intact. In many cases reading the abstract can substitute for reading the original.

"The name 'Concentrates' was selected because of its metallurgical significance and also because the items therein are in fact concentrated technical literature of the most valuable kind, with tailings removed."

## NORTHWESTERNERS HEAR TALK ON HEAT TREATING FURNACES

C. F. Olmstead February Speaker

By A. C. Forsyth

The February meeting of the Northwest chapter was held at the Manufacturers' Association in Minneapolis. C. F. Olmstead, sales engineer, Mahr Mfg. Co., was the speaker and his subject was, "Recent Developments in Heat Treating Machines and Equipment."

Mr. Olmstead discussed many different phases of heat treating equipment, stressing particularly the more recent developments. A few of the subjects were: the types of furnaces and their suitability for certain kinds of commercial work, new developments in oil and gas burners especially for luminous flames, insulating materials, new types of pyrometers including automatic optical types, problems in the heat treatment of very large sections and the use of heat resisting alloys.

The speaker also stated that much progress had been made by steel companies, in recent years on standardization of heat and corrosion resisting alloys and pointed out that this was a progressive step toward better and more efficient furnaces.

A lively discussion followed in which Mr. Olmstead was very generous in answering questions.

## STAGG'S ADDRESS PLEASSES SYRACUSE

March 15 Meeting Headlines  
Fine Talk on Stainless

By James M. Hutton

Howard Stagg, who is assistant general manager of the Halcemb Steel Co., read a paper on "Corrosion and Heat Resisting Alloys" before the Syracuse chapter on March 15.

"I have seen," he said, "estimated values of losses per year due to corrosion running as high as two billion dollars annually. Needless to say, this is simply a guess, but we do know that the losses are tremendous. In these losses, of course, is included the failure of engineering parts, the labor and materials used in the replacements and the many hours spent in painting and repainting.

"The true stainless, as we know it today, was discovered by Harry Brearley in 1913 and was first introduced to the public in the form of cutlery in 1914. Many earlier references to resistance to attack may be found and contributions have been forthcoming ever since 1821. All the various stainless alloys at the present time may be divided into two classes; those which contain essentially chromium in all proportions and those which contain nickel and chromium in all proportions.

"The two classes are quite different, metallurgically and physically, and can best be broadly classed into the ferritic or ferritic-chromium alloys and the austenitic alloys. In the first class fall the straight chromium alloys with little or no additions. These alloys in general are of a nature somewhat similar to the ordinary irons and steels with which we in every day life are familiar.

"The 4-6% chromes are finding their widest application in the form of tubes and in installation of the cooler portions of oil cracking stills. For those applications wherein the temperatures are not excessive nor the corrosion problems involved, this alloy finds its place.

"Chrome alloys lend themselves readily to those manufacturing processes accomplished through machining or riveting, but when welding must be resorted to it should be carried out only under very carefully controlled conditions and should be always followed by an annealing operation.

"In the second class, the nickel-chrome alloys have several outstanding characteristics, viz:

"They are non-magnetic, they are made softest and most ductile by quenching into water from high temperatures. Such hardness as can be obtained through heat treatment is obtained by slow cooling.

"They are characterized particularly by their greater resistance to corrosion attack by acids, alkalis or salts; by their resistance to oxidation and their remarkable strength at elevated temperatures."

An interesting discussion ensued.

## 53% OF SHOW SPACE TAKEN BY 75 FIRMS

Technical Program Plans for  
Convention are Maturing

Space assignments covering 53% of all available exhibit locations at the fourteenth Annual National Metal Exposition have been made. Seventy-five companies have already reserved space in the Exposition, which will be held at the 174th Regiment Armory in Buffalo, the week of Oct. 3, 1932.

Keeping pace with the Exposition plans, the technical program of the A.S.S.T. in the National Metal Congress is also nearing completion. Plans this year call for 9 technical sessions, not including the Wednesday, Oct. 5, annual meeting of the Society followed by the presentation of the Campbell Memorial Lecture. About three papers will be presented at each session in order to allow more time for written and oral discussion.

The list of papers and authors will be announced later in the REVIEW.

An important part in the 1932 National Metal Congress and Exposition will be played by firms and individuals connected with wire manufacture.

The Wire Association, of which John Mordica, Bethlehem Steel Co., Sparrows Pt., Md., is president, L. D. Granger, Wickwire Spencer Co., New York, and Herbert Horsfall, Canadian Wire & Cable Co., Ltd., Toronto, are vice-presidents, and R. E. Brown, New York City, is secretary, will have a series of meetings as part of the Congress, while a number of manufacturers of wire and wire drawing equipment have reserved space in the National Metal Exposition.

Besides the Wire Association, the following technical societies will cooperate with the A.S.S.T. in the Congress: American Welding Society; the Institute of Metals and the Iron & Steel Divisions of the American Institute of Mining and Metallurgical Engineers; the Iron and Steel Division of the American Society of Mechanical Engineers; and the Production Activity Division of the Society of Automotive Engineers.

## PHILADELPHIA MEN HEAR VAN DEVENTER

Honor Sustaining Members at  
Good Meeting on March 25

By Adolph O. Schaefer

Philadelphia celebrated its second annual Sustaining Members' Night at its regular meeting on March 25. Practically all of the sustaining members responded to the invitation to be the guests of the chapter, and their representatives filled the longest speakers' table the chapter has brought into service this year.

In a short talk following the dinner, Dr. Boynton expressed the chapter's appreciation of the loyal support of the sustaining members. He then called on each of them for a few remarks, which ranged from a simple thank-you to some good stories, and included many expressions of appreciation of the work of the A.S.S.T.

The program offered at the meeting was one to interest the many executives present as our guests as well as the members. The principal speaker was J. H. Van Deventer, editor of *Iron Age*. The subject was "Mechanization and Its Effects on the Metal Industries."

Mr. Van Deventer presented an authoritative set of figures and a convincing argument. His opinions were backed by facts, and combined with his sense of humor to produce a talk that was instructive and interesting.

The gist of the argument was that mechanization, or the use of better and better machine tools in production, is not responsible for our present depression. On the contrary, improvements in production machinery will surely lead us out of the conditions we find ourselves in. Employment figures taken over periods of many years show conclusively that employment has increased steadily through periods of intense mechanization and indicate that it will continue so to increase.

A grand discussion on business conditions gave all opportunities to air their views.

# THE REVIEW

Devoted to the interests of the American Society for Steel Treating

A Review of the Activities of the Chapters and National Organization of the A. S. S. T.

Published monthly except July and August by the  
AMERICAN SOCIETY for STEEL TREATING  
7016 Euclid Ave., Cleveland, O.

A. H. D'ARCAMBAL, President  
A. T. CLARAGE, Treasurer  
J. M. WATSON, Director  
B. F. SHEPHERD, Director



W. B. COLEMAN, Vice-President  
W. H. EISENMAN, Secretary  
F. B. DRAKE, Director  
H. D. MCKINNEY, Director  
C. F. PASCOE, Director

Subscription \$50 a year; 5 cents a copy

RAY T. BAYLESS ..... Editor  
JOHN G. MAPES ..... Managing Editor

Volume IV

Cleveland, O., April, 1932

No. 4

## CHICAGOANS ENJOY GROSSMANN'S TALK

Study Fine Points of Steel Making at March Meeting

By A. W. Sikes

The March meeting of the Chicago chapter of the Society was attended by 125 members and guests for dinner. About 125 more came in after dinner to enjoy the two extremely interesting talks which were scheduled. The first speaker was Lieutenant Julius Van Der Locht, wireless operator on the German cruisers "Emden" and "Cormorant" during the World War. He gave us a stirring talk covering his adventures while raiding Allied shipping in the South Seas, and the sinking of the "Emden" by shell-fire. He concluded his talk by telling the story of his capture when the "Cormorant" was beached on the Island of Guam and his internment by the United States Government in the German Prison Camp at Atlanta, Ga., for the balance of the war.

The technical discussion for the evening, "Precautions in the Manufacture of Quality Steels," was given by Dr. Marcus A. Grossmann, research engineer, Illinois Steel Co., Chicago. Walther Mathesius, assistant general superintendent of the South Works of this company, presided as technical chairman throughout the meeting.

Dr. Grossmann, as Mr. Mathesius pointed out, is well known to the members of the Society as the Campbell Lecturer for 1930, and for his eminent work in the field of ferrous metallurgy in this country.

Slides were shown illustrating both the Bessemer and open-hearth practices, including the size of scrap used and its relation to the surface oxidation, hence the iron oxide in the slag and, consequently, in the bath. The Heroult electric arc furnace, which operates with a reducing slag consisting of calcium carbide, and the 3½ ton Northrup high-frequency induction furnace (the largest in the world) which is used for the manufacture of alloys with extremely low-carbon content, were also shown.

Dr. Grossmann then gave us a flashback to the days of the crucible steel making process showing the small 100-pound lots and the small tool steel ingots which they produce.

The theory and practice of ingot design was then thoroughly covered by means of photographs and references to the Gathmann and Bradford ingot molds, the Harmet press and Cascade pouring. Sections indicating freedom from pipe and the lack of chemical segregation in big-end-up ingots using hot-tops were shown on the screen.

Next Dr. Grossmann discussed inclusions which, he stated, will vary both with the composition of the steel as poured (with special reference to the oxygen and sulphur content) as well as with the rate of solidification. The "woody structure" in high-speed steel, we learned, is due to the segregation of carbides resulting from improper solidification and is a function of the size of the ingot which influences the cooling rate. The smaller the carbide envelope the less the woody structure. The speaker showed how ingot cracks developed into seams in the blooms which were subsequently rolled out in sheet form resulting in the laminated structure causing defects in the finished product.

Dr. Grossmann closed his very interesting lecture by showing how too high a forging temperature gives a coarse grain instead of the fine grain structure desired. Subsequent annealing does not rectify any original errors in forging temperature because of the phenomenon known as "Grain Inheritance."

It was particularly gratifying to the chapter to have present large delegations from the International Harvester Co., headed by Messrs. Robinson, Knowlton and Rose, and from the Inland Steel Co., headed by Messrs. Nead and Ward for the dinner and the meeting.

## NOTRE DAME STUDIES X-RAY

W. G. Praed Tells Value of Radiography in Modern Industrial Practice

By Vance N. Uhlmeyer

Wm. G. Praed, radiographic engineer with the Claude S. Gordon Co., Chicago, spoke on the "X-Ray in Industry" before the members of the Notre Dame group on Feb. 18.

Mr. Praed showed with slides, the value of X-Ray in modern industrial practices. He also illustrated by photos how various faults in welding and other practices are brought to the attention of the manufacturer. The manufacturer is then in a better position to tackle his problem and overcome the difficulties.

X-Ray clearly exposes faults in metals that are almost impossible to find by other means.

## HARTFORD IS HOST TO SUSTAINING MEN

H. E. Koch Delivers Excellent Technical Talk on March 8

By James Allison

Representatives of the companies on Hartford's sustaining membership list were entertained at dinner, March 8, in the City Club and later treated to one of the best talks which Hartford has heard, at the Hartford Electric Light Auditorium. H. E. Koch, research department, Hevi Duty Electric Co., spoke on "New Developments in the Surface Hardening of Steel."

W. H. C. Berg, Whitney Mfg. Co., as technical chairman, introduced the speaker.

Mr. Koch described a vertical furnace for electrically heated gas carburizing. Forcibly directed circulation of the carburizing gas, which is disturbed as much as possible within the basket containing the work, causes maximum molecular activity in the dissociation of the hydrocarbon gases. Very uniform cases of superior quality are obtainable due to the fact that the carburizing gases are not introduced until the whole charge is at heat, that very close temperature control is available, and that soaking periods may be provided after the flow of gas has been stopped to allow diffusion of the case.

The furnace can be operated satisfactorily on natural gas or Pyrofax. A methane case usually has very sharp boundaries of the various zones. CO will carburize rapidly but will not give a carbon content of case over 0.50 to 0.60%. A liquid, Carbonol, has been developed to provide a carburizing gas which is constant in chemical composition.

The usual penetration of carbon, using carbonol, is 0.015" per hour and may be 0.025" at higher temperatures. The case depth of all parts in a charge will not vary more than plus or minus 5% for deep cases and plus or minus 10% for shallow cases, limits unheard of in carburizing. The case thus formed shows 850 to 950 Vickers Brinell through the eutectoid zone and the toughness is greater than usual in carburized work. Distortion is reduced due to the shorter time the work is at temperature.

This furnace is also suitable for bright annealing and nitriding. Methanol at temperatures over 1100° F., produces a slight carburizing action. Some work has been done with helium which not only is not absorbed by the steel but will drive out other gases.

Interesting descriptions of low temperature cases and mixed nitrogen and carbon cases were brought out in the discussion. The low temperature case is denser and wears better than a high temperature case except with high nickel steels such as SAE 3415. The low temperature case will harden to 850 to 950 Vickers Brinell and the penetration at 1450° F., is about 0.005" per hour up to 0.030 to 0.040" depth. The combined nitrogen and carbon case is obtained by mixing carbonol with nitrogenous material.

## 3 LOS ANGELES MEN SPEAK ON CASTINGS

March Meeting Has Papers by Kimberly, Butts, Kottenauer

By W. A. DeRidder

The program of the Los Angeles chapter's March 17 meeting consisted of three papers on "Castings, Their Uses and Properties." Grey iron was discussed by Si Kimberly, metallurgist of Axelson Manufacturing Co., malleable by W. E. Butts, superintendent, General Metals Corp., Western Malleable Plant, and alloy steel castings by Ed Kottenauer, metallurgist, Warman Steel Casting Co.

Mr. Kimberly opened his paper with the question: "Why do we use grey iron castings for certain machine parts, and malleable, or steel, castings for other parts? The answer to this question is that grey cast iron is a material of no ductility, but with high compressive strength and of varying tensile strength."

The speaker pointed out that grey iron, years ago, was made without serious regard to either the chemical or physical properties, but that due to a vast amount of research during recent years the foundryman and metallurgist are equipped with sufficient information to enable them to recommend to the engineer the correct iron structure best fitted to meet the particular problem presented.

Further, that when parts must be made of a rigid material, and, in some cases, when heat and abrasion resisting properties are required, only a good grey iron of correct structure will fill the bill. Mr. Kimberly then gave an outline of the usual method of producing grey iron castings, including furnaces and the materials employed.

A most interesting point in the paper was the statement that desirable structures were mainly achieved by controlling the silicon content. The method of how this is done was fully elaborated upon. Mr. Kimberly closed his paper by summing up the uses of nickel, chromium and molybdenum as alloying elements.

The second speaker, Mr. Butts, in his introduction to the uses of malleable iron, located this material on the equilibrium diagram. He stated that it lies between carbon steels and grey irons. In commercial use it fills the void between the more brittle grey irons and the harder steels.

He then gave some data regarding the chemical composition and physical properties of malleable iron, stressing its machinability and shock resistance.

Other highlights of this paper were the furnace charge, the method of melting malleable, and its subsequent annealing. Mr. Butts fully described the periodic type of annealing, which predominates in general usage. By this process the castings are placed in iron pots and are insulated from the outside air by suitable packing materials. The fire is started rather slowly and the temperature is increased until a temperature of 1600° F. is reached. This temperature is maintained for 48 to 60 hours and at the end of this time the temperature is lowered at a rate of not more than 8° per hour until a temperature of 1150° F. is reached. Then the doors of the oven are opened and the castings may be removed.

The third speaker gave an outline of different alloys used in the manufacture of steel castings, elaborating on the properties and values of the different alloying elements employed. Mr. Kottenauer stated that the great many different specifications now in vogue could be considerably narrowed down in order to enable the manufacturer of steel castings to make more steel of fewer types, and so reduce his costs, which saving would, of course, ultimately be passed on to the buyer.

The speaker, in closing, read a number of test reports, which clearly indicated what tensile strength, yield point, degree of resistance to corrosion, etc., can be expected from several compositions of alloy steel castings.

After each paper there was an opportunity for discussion.

## DEARBORN'S BOILER HYDROMETER

The new Dearborn concentration hydrometer, manufactured by the Dearborn Chemical Co., 310 So. Michigan Ave., Chicago, is designed for rapid and convenient determination of the total dissolved solids in boiler water. Concentration and blow-down requirements can thus be easily figured. The price, complete, is \$7.50.

## OFFER STAINLESS STEEL BOOKLET

An unusually attractive booklet, issued recently by American Stainless Steel Co., Commonwealth Bldg., Pittsburgh, depicts the history of the stainless steels and the widely varied uses to which they are put today. Copies may be secured by writing to the address given above.

## BAYLESS TELLS CINCINNATI OF METALLURGICAL CONTROL

Is Speaker at March Meeting

By N. C. Strohmenger

Ray T. Bayless, assistant secretary of the Society in charge of technical activities and editor of *Transactions*, presented a paper on the subject of "Metallurgical Control with the Minimum of Expensive Equipment," before the March meeting of the Cincinnati chapter.

This paper had originally been arranged to be presented by E. E. Thum, editor of *Metal Progress*, but due to his sudden illness he was not able to be present, and Mr. Bayless kindly offered to present this paper for him.

We were told of the different qualifications required to fulfill the position of a metallurgist at various plants. After a well trained and intelligent man has been picked, you should secure a small amount of equipment which was outlined as necessary to cover many phases of the inspection, heat treating, microscopic examinations, and testing of materials. A number of slides were shown of equipment that is found helpful in metallurgical work.

We had a lengthy discussion that was very beneficial to many present.

## SHEPHERD OUTLINES TIMBRE TO LEHIGH

Explains How Similar Steels Vary in Their Behavior

By J. M. Weil

The subject of steel "Personality" which has been discussed before many chapters by B. F. Shepherd, chief metallurgist of Ingersoll Rand Co., National Director, and member of the Lehigh Valley chapter was at last presented to his home chapter on March 4.

Steel personality was described as that characteristic of materials which produces entirely different physical properties in materials of identical chemical composition. Originally this quality was known as body. Mr. Shepherd described the evolution of this term, the use and value of brand names, the emphasis placed later on chemical composition and now the present gradual realization of many metallurgists that "personality" or "timbre" is a concrete characteristic of materials.

The inspection and control methods necessary for production of high quality parts produced by Ingersoll-Rand Co. were described. Examination for physical defects were illustrated by slabs etched or fractured to show defects or satisfactory quality of material. The necessity for use of materials free from defects was illustrated by actual examples of pieces that had been hardened and that had been put in service in which the nuclei of failure were clearly shown to be a defect of the same character as that shown on the slabs.

The difference in depth of hardening of tool steels of similar chemical analysis led to the development of the Shepherd hardenability tests. This was described. By its aid the difference in hardening characteristics of various steels was shown. These differences were also shown by McQuaid-Ehn and actual service tests.

In this talk on steel personality, Mr. Shepherd endeavored to call attention to a difference in quality of materials which is not usually ascertained until trouble develops in fabrication or in the field. The development of tests to determine "timbre" in alloy steels is very much to be desired. The purchase of tool steel with "timbre" as one of the main criteria of selection will result in an improved product, a culling out of undesirable sources of supply and a better understanding of this peculiar quality of steel.

## COPPER BALTIMORE'S TOPIC

W. S. Girvin Shows Movie and then Talks on Copper and Its Alloys

By John Borland

On February 29 the Baltimore group had a record meeting with an attendance of about 100, including some of the York chapter. The motion picture "Anaconda Copper from Mine to Consumer" was shown and explained by W. S. Girvin, who later delivered an interesting lecture on the properties of the various alloys which include copper. Mr. Girvin definitely fixed the various brasses, bronzes, and other rarer alloys in their proper order in relation to each other and the uses of each.

The attendance was large due to the wide range of notices sent out to all of the copper interests in Baltimore, which contains one of the largest copper refineries in the world.

## DETROIT'S MEETING CONCERNING ALUMINUM

R. S. Archer Talks About Light Metal's Use in Automobiles

By O. W. McMullan

The March meeting of the Detroit chapter was held in Hotel Fort Shelby on March 14. Through the courtesy of the Bausch and Lomb Optical Co., a three reel film entitled "Eyes of Science" was presented dealing with photography and photographic equipment.

The technical speaker was Robert S. Archer, director of metallurgy of the A. O. Smith Corp. His subject was "The Use of Aluminum Alloys in the Automotive Industry." Mr. Archer pointed out the outstanding advantages of aluminum as being due to lightness and thermal conductivity. It also has some use as an electric conductor and for non-corrosive purposes.

From a standpoint of design the advantage of aluminum is in stiffness rather than tensile strength. The modulus of elasticity is one-third that of steel and steel is 2.8 times as heavy. A bar of aluminum of the same weight of steel is slightly weaker than steel in tensile strength which varies directly as the cross section area but is much stiffer as a beam where stiffness varies as the cube of the depth. The aluminum alloys will, therefore, have about 51% of the weight for the same rigidity.

An aluminum car built by the Aluminum Company of America was brought to the meeting. This car was a 75 H.P. roadster of 133 inch wheel base, and weighed 2600 pounds. It had been driven 200,000 miles. The frame, front axle, rear axle housings, steering knuckles, wheels, motor block and cylinder head, pistons, connecting rods, body and other parts were made of aluminum alloys. The saving in weight with a large number of parts becomes cumulative so that the saving per part becomes greater than if but a few parts are changed from iron to aluminum. It was stated that weight in an automobile has little to do with speed or rideability, the latter depending upon the ratio of sprung to unsprung weight. There is little advantage in braking as that depends upon weight and tire friction but better brakes are required with greater weight. Acceleration is increased and operating economy is obtained since the pay load can be increased.

Heat treated aluminum alloys compare to aluminum as heat treated alloy steels to iron. Heat treatment has been found to remain permanent for 10 to 15 years at room temperature. The usual solution and precipitation treatments were described. Forming operations are easier to accomplish on quenched parts before aging takes place. Rivets can be packed in dry ice to prevent aging until used. Machining of duralumin is easier than pure brass but not as easy as leaded brass. The energy required in forging is about the same as that for steel. The forging temperature is about 800° F.

Various articles were exhibited in the forged or rolled condition and slides showing compositions, treatment, properties, etc., of cast and wrought alloys were presented. The largest casting ever made weighed 3800 pounds and the largest treated casting weighed 1600 pounds. An automobile wheel and brake drum forged in one piece contained a cast iron liner shrunk and riveted in place. The iron lining gets hottest and the difference in expansion is compensated for in this way. Heat flow between the materials is good. Steel caps are used with aluminum connecting rods to compensate for expansion on the shaft. When aluminum is to be cast around steel parts cadmium plating is done as the bond is not good between iron and aluminum.

At the close of Mr. Archer's talk a general discussion ensued.

## NEW HAVEN CHAPTER RESOLVES

"In the final estimate of a man, no qualification has as great an influence as that he loved and was loved by his fellow men." In full realization that Allen Hilton was a friend of all who knew him, the New Haven chapter of the American Society for Steel Treating offered the following resolution and authorized that it be spread upon the minutes of the organization and a copy sent to his widow, Anne Hilton.

"Since God in His infinite wisdom has called unto him our friend and fellow member Allen Hilton, therefore be it resolved that we as an organization express our sincere sense of loss of one who in every way exemplified the qualities that endear one man to another. Possessed of unusual abilities as an engineer, faithful in the trusts committed to him in his industrial assignments, grateful for an opportunity to share his portion of the burden in our association activity, radiating an unassuming loveliness, he won for himself a treasured niche of friendship in the hearts of our membership. His alert mind and kindly disposition will live as a lasting memory and a worthy example in the minds and hearts of all who knew him."

## 600 ATTEND YORK'S BIG JOINT MEETING

Local A.S.S.T. Members Stage Monster Meeting March 25

By Arthur W. F. Green

An attendance of more than 600 interested men makes the March 25 meeting of the York chapter one of the finest that it has ever held. The subject for the meeting was a new lecture, illustrated by motion pictures, on the "Manufacture of Steel and Steel Products," by George A. Richardson of the Bethlehem Steel Co. The meeting was held in the Auditorium of the local Y. M. C. A. The chapter invited the following societies to co-operate with them for this meeting: Engineering Society of York, Susquehanna Section, A. S. M. E., and York Foremen's Club. Representations were present from Lancaster, Waynesboro, Chambersburg, Harrisburg and Lebanon, Pa.

The meeting itself was divided into two periods, one in which there was discussion of general chapter business, at which time an excellent opportunity was afforded for discussing the many advantages offered by the A. S. S. T. Particular emphasis was placed on the publications of the society and the advantages of each.

The educational work of the chapter was discussed and it was brought out that on March 21, 15 individuals had been granted certificates showing successful work in the Metallurgy Class at the York Y. M. C. A., and that on March 28, 40 individuals would receive certificates at the Harrisburg Y. M. C. A. These courses have been given under direction of Arthur W. F. Green, metallurgist with the American Chain Co., Inc., at York. The text matter has been developed in collaboration with the members themselves in the nature of mimeographed notes, and 88 pages, covering much of the matter that has been discussed in the class, has been made available to the students. These notes are excerpts from many sources and especially from *Transactions of the A. S. S. T.*

Mr. Richardson took over the conduct of the meeting after the general business session and proceeded immediately with showing of his nine reels of motion pictures. These pictures had never been shown in the vicinity and proved of tremendous interest. The York chapter fully appreciates the courtesy shown by the Bethlehem Steel Co. in sending Mr. Richardson as the speaker on this occasion and making available the motion pictures that were shown, and takes this opportunity of publicly thanking them.

The next meeting of the York chapter will be held in Harrisburg, Pa., on April 13, the subject to be discussed being "Open Hearth Control," and the speaker, V. O. Lawrence, metallurgical engineer of the Alan Wood Steel Co., Conshohocken, Pa.

## PAGE INFORMS NEW HAVEN OF X-RAYS

March Meeting at Bridgeport on Radiography in Foundry

Bridgeport was host to the New Haven chapter on March 17. The dinner and meeting was held in the Hotel Barnum. Alfred Bodine, general manager of Raybestos Co., gave a short talk following the dinner.

E. W. Page, General Electric X-Ray Co., was the guest speaker at the technical session. His subject was "The X-Ray in the Foundry."

Mr. Page stressed the use of the X-ray particularly in the manufacture of castings. Many hidden defects such as internal cracks, inclusions, gas pockets and shrinkage, are very clearly revealed.

The X-ray is not intended for the examination of every casting, but for casual examination for the detection of such flaws which will later be corrected by the study of the defects and determining the nature and causes of them.

A comparatively few years ago the idea of using the X-ray in industry to any appreciable extent was considered a possibility more or less remote. But, along with many other new and scientific methods which have been adopted by the manufacturing arts from time to time, the X-ray is today recognized as indispensable to the solution of certain problems peculiar to the fabrication of materials and varied processes of manufacture.

When the X-ray was discovered by Prof. Roentgen in 1895 it was not intended that the medical science would be the only one to benefit. Roentgen himself used this instrument in his study of internal structures of metals and other materials.

## MARCH MONTREAL MEETING IS ADDRESSED BY A. S. S. T. HEAD

Machinability Talk is Popular

By Gordon Sproule

At the Windsor Hotel on March 7, Montreal celebrated a banner evening, the occasion being the visit, as guest speaker, of our president, A. H. d'Arcambal. After the regular dinner members listened to an interesting coffee talk on fishing along the line and in the parks of the Canadian National Railway.

A particularly interesting point was the enormous growth and multiplication of trout planted in a virgin glacial lake in Jasper Park. This was followed by two reels of motion pictures showing fishing, particularly in lakes accessible by aeroplane in the North Country near the Canadian National Railway.

Mr. d'Arcambal's talk, which was a treat for everybody and a revelation to a great many, dealt with the machinability of metals. Points covered included comparative machinability of steels, cutting oils, heat treatment, and chromium plated tools.

Unfortunately, due to a late start, Mr. d'Arcambal was somewhat hurried and the discussion was cut short, but he gave us a great wealth of information.

Despite a severe storm, 94 members were present for dinner and 224 attended the meeting. Fourteen new members were added during the month.

## HARTFORD MEETS IN NEW BRITAIN FEB. 9

Plant Visit Followed by Talk by E. D. Milener on Gas

By J. Allison

On Feb. 9 for the first time in several years the Hartford chapter held its meeting outside Hartford in one of the other cities served by this chapter. The new departure was very successful as evidenced by an attendance of 40 for the afternoon's plant inspection of the New Britain Gas Light Co.; 48 dined at the State Trade School and over 100 attended the lecture.

The plant visited is a carburetted water gas producer and very capable guides were provided for this interesting trip.

The speaker of the evening, Eugene D. Milener, industrial research representative of the American Gas Association, gave an up-to-the-minute discussion of the subject "Some New Angles on the Utilization of Gas in Industry."

The speaker briefly described the work of the Association and touched upon some of the conclusions of D. W. Murphy and W. E. Jominy whose work was partly sponsored by the Association, and he distributed copies of the bulletin published by the University of Michigan covering this work on "The Influence of Atmosphere and Temperature on the Behavior of Steel in Forging Furnaces," which data has been presented before the A.S.S.T. conventions the past two years.

New forging furnace equipment is now available in which scale-free heating for forging can be obtained by use of the diffusion flame combustion, protecting the work with a gas blanket. Gas and air are admitted to the furnace in alternate layers proportioned to give perfect progressive combustion.

The layers flow parallel to the furnace bottom at the same slow speed and as the hydrocarbons are broken down the incandescent carbon provides a highly luminous flame for rapid heating by radiation. An extra gas layer covers the forgings and protects them from scaling up to temperatures as high as 2400 degrees F.

Work on carburization of steel has fixed the relative descending order of active decarburizing agents as follows: hydrogen, carbon dioxide, water vapor, and oxygen. Nitrogen is without decarburizing effect only if dry and pure. Sulphur is without effect in amounts present in a gas-fired furnace. Scale in some cases inhibits decarburization and strongly oxidizing furnace atmospheres produce less decarburization than those containing smaller percentages of free oxygen.

Credit for the success of this meeting is largely due to B. S. Lewis and James S. Skinner, who were in charge of the arrangements.

## R. & H. DESCRIBES REFRIGERANT

Roessler & Hasslacher Chemical Co., Niagara Falls, N. Y., is distributing folders describing its Arctic refrigerant, which has especial application in the food industries. Copies may be obtained from the company's offices.

## ONTARIO PAPER ON ALUMINUM BRONZE

Jerome Strauss Talks to 100 at Toronto Meeting Feb. 5

The regular meeting of the Ontario chapter was held on Feb. 5 in the Royal York Hotel, at Toronto, with an attendance of about 100.

An interesting coffee talk on "Animal Coloration" was given by Dr. S. Hadwen, director of veterinary research, who has made a special study of this subject.

Dr. Jerome Strauss then gave a paper based on the latest experimental data on "Aluminum Bronzes." The field for these materials covers conditions where capacity to resist high pressure is required, where resistance to corrosion is necessary (especially salt water corrosion) or where extreme bearing pressures have to be taken care of.

From the binary diagram for aluminum and copper it might be expected that any alloy with over 7 1/2% aluminum should be hardenable, but in practice it is found that for noticeable results the percentage should be over 8 1/2%. Alloys containing less than this are soft and ductile and suitable for cold working, whereas those containing more aluminum are capable of being hardened by quenching.

Even the bronzes with aluminum as high as 9 or 10% may be worked both hot and cold and severe cold work may produce in small sections tensile strengths as high as 150,000 lb. per sq. in., with decreased ductility.

The effects of various other metals were taken up. Iron gives a finer grain size and a greater strength on cold working which may be largely retained on later reheating. Due possibly to the finer grain the iron has a tendency to increase corrosion resistance. The iron is commonly used in amounts of approximately 3%.

In foundry practice a number of special precautions must be taken. It is important to keep the metal free from contact with reducing gases, which are readily absorbed by the metal. The shrinkage during solidification is high and therefore tends to produce pronounced pipe. This has to be provided for by the use of large heads of risers. Aluminum oxide dross forms readily and may cause a dirty surface for some depth if pouring is not carefully done. Precautions should be taken to avoid agitation of the metal. This dross surface also causes trouble with cutting tools. Phosphorus is injurious and should not be used as a deoxidizer.

## NITRIDING MEETING INTERESTS BUFFALO

Sergeson Addresses Chapter at Feb. 11 Session

By Clyde Llewelyn

The sixth regular meeting of the Buffalo chapter for the 1931-1932 season was held at the Buffalo Hotel on Feb. 11. Dinner was served to 32 members and guests and there were 64 present at the regular meeting which followed.

Chairman J. H. Birdsong gave a short talk on the coming National Metal Congress and Exposition and urged all members to start working immediately to make the Buffalo Show a huge success.

The chairman next introduced the speaker of the evening, who was Robert Sergeson, of Central Alloy division, Republic Steel Corp. His subject was "Nitriding."

Mr. Sergeson gave a very interesting talk on the nitriding process, which is coming more and more into general use. The speaker has been intimately connected with this process for a number of years and he went into the history from the time of its inception, outlining numerous changes and modifications which have been made, tried out and either adopted or discarded since that time in the metal itself and in the heat treatment, furnace design, etc.

He also outlined different chemical analyses of nitrailloy, and explained the heat treatment, most suitable temperatures, case depths and hardness of case obtainable, physical properties, structures, method of denitriding, corrosion resisting properties of a nitrided case, etc.

His talk was illustrated with very appropriate slides, and at its conclusion a great amount of interest was shown, as evidenced by the fact that a large number of questions were asked of Mr. Sergeson, all of which were satisfactorily answered.

## KOPPERS CO. OFFERS STIBLOY

Stibloy Products Co., Inc., Koppers Building, Pittsburgh, has taken over the assets of Liquid Metal Products, Inc., Chicago, producers and distributors, under the Arent patents, of Stibloy, a metal compound in liquid form which acts as a primary coating to hold paint, enamel and lacquer tenaciously, permitting immediate finishing of new galvanized metal surfaces.

Stibloy extends the life of galvanized surfaces by protecting them from corrosive atmospheric conditions, gases, acid fumes, smoke and brine. It is used as a primer, not a paint, for preserving galvanized roofing, siding, sheeting, guttering, downspouts, wire fencing, air ducts, car roofing, screens, nails, transmission towers and other galvanized products.

Stibloy will be manufactured in the various plants of Koppers Products Co.

## TIMBRE IS TOPIC AT R. I. MEETING

Meeting Has B. F. Shepherd and A. Movie as Attractions

By Stuart A. Woodruff

The March meeting of the Rhode Island chapter was held Wednesday, March 2nd. An informal dinner was served at the Minden Apartments preceding the meeting. The meeting was held in the auditorium of the Engineering Building at Brown University.

The first feature of the evening was the presentation of the now famous Harvard Engineering School moving picture, made by Messrs. Leland Van Wert and Bruce A. Rogers. This picture depicts photographically transformation, recrystallization, melting, and solidification phenomena. Dr. Van Wert was present and explained details of the picture. The film was enthusiastically received.

The main speaker of the evening was Ben F. Shepherd of the Ingersoll-Rand Co., who discussed "Personality in Tool Steels."

Mr. Shepherd stressed the importance of chemical specifications, but pointed out the need for additional specifications. He showed that cleanliness has a most important bearing on the performance of tool steel, and that macroscopic examination, by an acid etch, has been successfully used by Ingersoll-Rand Co. to determine the presence of non-metallic inclusions.

Mr. Shepherd showed that different heats of steel of nearly identical chemical analysis varied greatly in their ability to harden. The Ingersoll-Rand Co. therefore set up tests to be run on each heat of tool steel to determine the hardness depth at various quenching temperatures. This depth is expressed in thirty-seconds of an inch and is termed "hardenability number."

The meeting was one of the most successful of this year, with an attendance of well over 200 people.

Other meetings held this season are as follows.

October—Geo. A. Richardson, Bethlehem Steel Co., "Steel and Steel Products."

November—R. C. Cook, vice-president, Wallace Barnes Co., "Springs."

December—H. W. McQuaid, chief metallurgist, Timken-Detroit Axle Co., "Selection of Steel for Carburizing."

January—E. V. Crane, E. W. Bliss Co., "Plastic Working of Metals in Power Presses."

February—W. S. Girvin, assistant metallurgist, American Brass Co., "From Mine to Consumer."

## LAVINO CO. FOLDERS AVAILABLE

A folder describing Wetkrome, ready mixed chrome cement has been issued by E. J. Lavino Co., Bullitt Bldg., Philadelphia. This company is also prepared to distribute a folder on improved Lavino Chrome Brick.

## Focussing Pocket Microscope

This new type vest pocket microscope has three powers—  
80X, 100X and 120X  
—and can be closely  
focussed!

Accurately ground lenses and the exclusive micrometer focussing feature make this microscope an asset in the laboratory as well as in the shop.

Its very low price, \$7.00, places it in reach of every individual or firm.



### ORDER BLANK

To: The Ripley Company, 2900 Meadowbrook Blvd., Cleveland, Ohio.

Please send me, postpaid, \_\_\_\_\_ hand microscope (s) for which \$7.00 each is enclosed.

Please send me, \_\_\_\_\_ hand microscopes by mail, C.O.D.

Money refunded if microscope is not satisfactory

Name: \_\_\_\_\_

Street and No. \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

## SHEET AND STRIP ARE WASHINGTON TOPICS

Joseph Winlock Speaks Before Good Meeting on March 18

By W. R. Angell

The sixth monthly meeting of the Washington chapter was held March 18 at the Interior Department Building. The informal dinner preceding the technical session was held at Harvey's Restaurant where 25 members and guests enjoyed a chatting with the speaker of the evening—Joseph Winlock, chief metallurgist of the Edward G. Budd Manufacturing Co., before taking up the subject of "Stamping, Drawing and Forming of Sheet and Strip Steel."

Some of the high spots of Mr. Winlock's splendid paper follow.

Both rimmed and killed steels are used for deep drawing sheet and strip although the present tendency is to use rimmed steel almost entirely. A basic open hearth steel with the carbon content under 0.14 and the manganese under 0.60 with low sulphur and phosphorus is most widely used. By increasing the carbon above 0.14% experience shows too marked decrease in ductility. The exceptions are steels for light draws or for a series of light draws with intermediate annealing, also steel of heavier gages for auto brake drums, axle housings, chassis frames, etc.

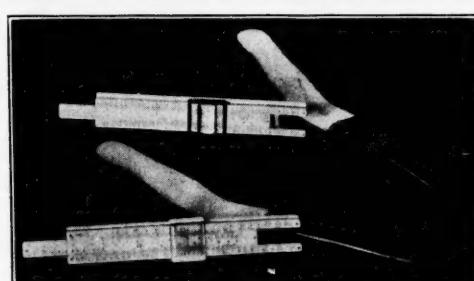
The ingot is rolled to a sheet bar, then cut to a length approximately the width of the final sheet and then cross rolled to the desired length. The usual annealing, pickling and cold rolling follows. Spontaneous annealing takes place on the hot mill until a temperature of 1100° F. is reached.

Sheet steel is cold rolled primarily to obtain good surface quality, uniform gage and flatness and freedom from buckles and waves. Reductions in thickness by cold rolling are seldom more than 3%. Slight cold rolling cannot be detected under the microscope by the shape of grains although the final cold rolling may markedly lower the deep drawing qualities. Hardness is not a reliable indication of deep drawing properties.

No general rule can be made for "springback" as the design varies for different stampings. Worms or stretcher strains are due to the fluctuations occurring at the yield point caused by the comparatively sudden transitions in different grains or groups of grains from the elastic to the semi-plastic state. The elongations necessary to produce stretcher strains are between 1.5 and 10%. They occur therefore in stampings or those parts of stampings where the amount of the draw is comparatively slight. Steel in the semi-plastic state is then, best suited for deep drawing and may be put in this condition by cold rolling, roller leveling or stretcher leveling.

### CHRYSLER ADDS NEW TYPE FURNACE

Another continuous gas carburizing furnace, employing the Eutectrol process, as manufactured by Surface Combustion Corp., has been purchased by Chrysler Motor Corp. for their Newcastle, Ind., plant. The furnace is to be used for carburizing free wheeling shafts.



THIS  
POCKET  
SLIDE RULE  
REALLY  
WORKS

This slide rule is indispensable in making frequent calculations in the plant, the laboratory or on the road. It's sturdily built and very accurate. A neat, good grade, leather case easily fits one's vest pocket—available for instant use.

The rule is 5 inches long and has square, tangent, sine and logarithm scales in addition to the usual scales for multiplying and dividing. The divisions are ruled with extreme accuracy. Built of plied bamboo held rigidly by an aluminum frame, the rule will not warp or gather dampness in normal use. The slide is a sturdy metal frame protecting a solidly mounted glass. A magnifier available at slight additional cost, aids materially. . . . The price is only \$2.50 for the rule and leather case; with magnifier, \$3.00.

You can have the rule for 10 days free examination.

#### ORDER BLANK

To: AMERICAN SOCIETY FOR STEEL TREATING, 7016 Euclid Ave., Cleveland, Ohio

Please send me \_\_\_\_\_ pocket slide rules for 10 days free examination.  
\_\_\_\_\_  
rules without magnifier at \$2.50 each.  
\_\_\_\_\_  
rules with magnifier at \$3.00 each.

( ) Cash enclosed. ( ) Please render invoice and I will pay promptly.

Name \_\_\_\_\_

Street and No. \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

## FELT AND STEEL NOW UNITED

According to a recent research report by Dr. A. W. Coffman, a new protected metal called "Robertson-Bonded Metal" (R-B-M) has been carried through the laboratory stages of development at Mellon Institute of Industrial Research.

Robertson-Bonded Metal is a laminated metal-felt material in which felted materials are cemented to steel with heat and pressure, utilizing metals as adhesives. The composite laminated material is then saturated with any desired saturant, such as paint, lacquer and resin films, chosen with reference to the corrosive condition to which the metal is to be exposed in service.

The ductility of the metal bond between felt and steel makes it possible to subject this material to forming operations such as shearing, bending, corrugating, rolling and mild drawing without destroying adhesion between felt and steel.

## MARCH JERSEY TALK CONCERN SPRINGS

R. W. Cook Describes Spring Design and Manufacture

By J. Sammon

The March meeting of the New Jersey chapter was held in the lodge room of the Elks Club in Newark, and all future meetings will be held there on the first Monday of each month.

The March 2nd meeting attendance was 139. The Weston Electrical Instrument Co., Newark, N. J., had on display an exhibit of finished electrical measuring instruments and parts, including the Photronic cell with associated apparatus which is one of their recent developments.

The title of the moving picture was: "The Manufacture of Lamps," and was presented by The Westinghouse Lamp Co. of Bloomfield, N. J. This picture shows the complete manufacture of an incandescent lamp from the melting of the glass for the bulb to the finished product, also showing the complicated machinery necessary to produce the lamps automatically.

R. W. Cook, vice-president of Wallace Barnes Co., Bristol, Conn., was the speaker and his subject was "Manufacture and Heat Treatment of Springs."

Mr. Cook pointed out that most people do not realize the important part that springs play in our everyday life as they are not only a necessity but also add greatly to our comfort.

Mr. Cook had a number of springs with him to help illustrate his talk, and he explained the kinds of steels used for certain types of springs, the very close tolerances they must adhere to and on a black-board he showed the formulas used to calculate the load or stress that springs will stand.

Mr. Cook inquired every now and again if he had made himself clear and invited questions. Thus the members had a chance to ask questions while the subject was fresh in their minds.

Mr. Cook closed his talk with slides showing wire drawing machines, spring machines and various types of annealing and hardening furnaces used throughout their plant.

## BOSTON HAS ADAMS AS FEB. 5. SPEAKER

Forging Paper Interests 100 Who Braved Storm to Attend

By Howard E. Handy

The February meeting of the Boston chapter was held on Feb. 5, at Massachusetts Institute of Technology, Cambridge, and was preceded by a dinner in Walker Memorial. Because of the heavy snow and ice storm which made travelling particularly hazardous, the attendance was only about fifty. The coffee talk was given by Dr. George B. Waterhouse, professor of metallurgy at M.I.T., who described in his usual interesting manner, some of the latest developments in metallurgy, with particular reference to electric steel furnace and blast furnace accomplishments.

The guest speaker was J. R. Adams, superintendent of the special products department of the Midvale Co., Philadelphia, whose subject was "Practical Forging and Forging Problems." Mr. Adams reviewed the evolution of heavy steam hammers and hydraulic forging presses, describing the effect of each type of forging equipment on the material being worked.

He then showed a series of slides illustrating the equipment employed by his company in the manufacture of heavy ordnance, pressure stills, rolls, etc., and discussed the methods of forging and heat treatment, difficulties encountered and the tests employed in the manufacture of these products.

While Mr. Adams' talk was confined almost wholly to very heavy forging work, the discussion which followed included the lighter forgings more generally used in this district. The attendance at the meeting was about 100.

## CARBIDE TOOLS ARE PHILADELPHIA TOPIC

G. J. Comstock's Talk Creates Enthusiasm Among Members

By Adolph O. Schaefer

The enthusiasm and interest engendered by Bill Eisenman's visit a month ago carried over to the February meeting of the Philadelphia chapter, and another large turnout cheered the hearts of the membership committee.

The date was Feb. 26. The time and place were the usual 8:00 P. M. and the usual Engineers' Club.

A surprise coffee talker was promised, and a real surprise was furnished. None other than the Honorable Kern Dodge, director of public safety of the City of Philadelphia was present and gave the talk.

Philadelphia's government was turned over to a new administration on January 1st, 1932. It may perhaps best be described as an anti-gang but liberal element that is now in control. The new Director of Public Safety has been a well known consulting engineer in Philadelphia.

The speaker of the evening, imported from McKeesport, Pa., was Gregory J. Comstock, director of research of the Firth-Sterling Steel Co. His subject was one next to his heart—"High Speed Steel and Tungsten Carbide."

Interest was evident from the start of the talk. Many had seen, heard of, or tried the new tungsten carbide cutting tools in one or more of their various ramifications. None had heard the complete story of the development and manufacture of these materials. Mr. Comstock's talk began with the history of his subject. The story of its manufacture was illustrated by excellent slides. Photomicrographs showed the structural differences existing in various grades.

The talk and the speaker can be heartily recommended. Seldom has the chapter participated in such a stimulating discussion. The chairman had to silence the meeting with his gavel to announce its adjournment at a late hour.

#### BLANCHARD BULLARD CO. DIRECTOR

At the annual stockholders meeting of The Bullard Co. held at Bridgeport on March 16, E. P. Blanchard was elected to the board of directors. Mr. Blanchard has been connected with the company for twelve years during which time he has held the positions of advertising manager and sales manager.

A new direct reading, single pen, absolute pressure gage of the recording type has been developed by Bristol Co., Waterbury, Conn.

## SALES REPRESENTATIVES

Wanted by conservative firm manufacturing full line of carburizing and metallurgical materials. Only men who have wide acquaintance and following considered. Commissions only. Please state territory covered and record. Address 2-10.

## Employment Service Bureau

Address answers care of A. S. S. T., 7016 Euclid Ave., Cleveland, unless otherwise stated.

### POSITIONS WANTED

TOOL MAKER AND HEAT TREATER with 12 years as general foreman of tool making and heat treating; 2 years experience in nitriding development work; considerable experience in design and building of oil fired heat treating furnaces; 30 years

with leading valve maker. Address 2-35.

TECHNICAL GRADUATE with 24 years experience, chiefly in engineering and alloy steel metallurgy and heat treatment, is open for engagement. Address 4-5.

**\$1.00**

**Brings These Books to You**

**I**f this were the only set of the NATIONAL METAL LIBRARY printed, it would cost a fabulous sum. Actually, thousands of sets have been printed and you may buy one for very little. The total cost is only \$16.00. \$1.00 brings you the books, the balance in 5 easy monthly payments of \$3.00 each.

The heat treatment and metallurgy of iron and steel, elusive and complex subjects, are clearly explained. Selection of steels, nitriding, quenching, carburizing, inclusions and similar subjects are covered in detail. Valuable production data by eminent authorities is given in each book. The eight books present the whole story.

**Lectures on Steel and Its Treatment by John F. Keller**

A blacksmith who by long and careful study has mastered the mysteries of iron and steel so that he makes them understandable through homely similes and every day comparisons.

**Principles of Heat Treatment of Steel by the Metallurgical Staff, Bureau of Standards**

Presents the basic reasons for the behavior of steels when heated, cooled or quenched. It contains a comprehensive bibliography, a great aid in studying specific problems.

**Heat Treatment, Uses and Properties of Steel by H. B. Knowlton**

Assistant Chief Metallurgist of International Harvester Co. covers the various plain carbon and alloy steels, their selection and properties obtainable by various treatments. The author goes at length into the peculiarities of each steel, methods and equipment for handling, carburizing, heat treating and cleaning.

**The Constitution of Steel and Cast Iron by Frank T. Sisco**

Editor, Alloys of Iron Research, explains in his clear, understandable manner the metallurgical functions of carbon and the common alloying elements, the effects of heat treating and variations in alloy content to secure internal structures that give desired physical properties. Cold working, carburizing and treating of worked and carburized steels are presented at length.

**The Quenching of Steels by H. J. French**

In charge of steel development, The International Nickel Co., clarifies this subject. Cooling mediums are classified. The effect of size and shape of work in process and sources of variation in hardening are presented in detail. Gives a simple means of selecting proper cooling solutions; also tables for determining internal and surface condition of steels after quenching.

**Nitriding Symposium**, papers presented by several authorities at the Convention of the A.S.S.T., reviews the possibilities of this process, selection of nitriding steels and proper application of the process.

**Inclusions in Iron by Dr. C. R. Wohrman**

Is a careful study of the common inclusions, their nature and effect.

**The Application of Science to Industry by Dr. W. H. Hatfield**

Director, Brown-Firth Research Laboratories, England, is an interesting review of British steel making and rolling practice. He discusses many of the common steels. Chapters on steel at elevated temperatures and tool and cutlery steels contain much valuable data.

**The cost is \$21.50 if books are purchased separately.**

**NATIONAL METAL LIBRARY costs only \$16.00**

**\$1.00 Brings You the Books**—The balance in easy monthly payments of \$3.00 each. For cash deduct 10%.

To: The American Society for Steel Treating, 7016 Euclid Ave., Cleveland, Ohio.

Please send me ..... sets of the NATIONAL METAL LIBRARY, 10 days free examination, postpaid in U.S.A. and Canada.

Please check:

- \$1.00 enclosed for down payment, balance \$3.00 monthly, for next 5 months.
- Enclosed is cash in full (deduct 10% for cash)
- Please bill me and I will remit promptly and in full (deduct 10% for cash)

Name .....

Street and No. ....

City..... State.....